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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/667,142	09/22/2003	Jun-Ichi Hashimoto	033035M132	7202
441	7590	10/07/2005	EXAMINER	
SMITH, GAMBRELL & RUSSELL, LLP 1850 M STREET, N.W., SUITE 800 WASHINGTON, DC 20036			NGUYEN, PHILLIP	
			ART UNIT	PAPER NUMBER
			2828	

DATE MAILED: 10/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/667,142

Applicant(s)

HASHIMOTO ET AL.

Examiner

Phillip Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 9/14/05, 6/2/05. 401707 | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 29 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim recites “wherein said first and second SCH layers *is* made of” which is not clear if there is more than 1 layer.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-9, 12, 15-26, 29, and 32-33 are rejected under 35 U.S.C. 102(b) as being anticipated by Sato (JP410075017A).

With respect to claims 1 and 17, Sato discloses in Fig. 1 a semiconductor optical device comprising first conductivity type semiconductor region 103, provided on a surface of GaAs semiconductor 101, having first and second semiconductor portions, said first semiconductor portion having primary surface (surface of layer 103 which intersects with layer 102), said

primary surface having a first area and a second area, said first area being provided between said second area, said second semiconductor portion having a pair of side surfaces, said second semiconductor portion being provided on the first area said first semiconductor portion; an active layer 105, provided on said second semiconductor portion of said first conductivity type semiconductor region, having a pair of side surfaces; a second conductivity type semiconductor layer 107, provided on said active layer, having pair side surfaces; and a current block semiconductor region 109 and 110 for confining carriers to said second semiconductor portion, said active layer, and said second conductivity type semiconductor layer; wherein the current block semiconductor region provided on the second area of the first semiconductor portion of the first conductivity type semiconductor region, said surfaces of said second semiconductor portion, said side surfaces of said active layer, and said side surfaces of said second conductivity type semiconductor layer; wherein said active layer is made of III-V compound semiconductor including at least nitrogen (N) as a V group member; and wherein said active layer provided so as to generate light having a wavelength of 0.9 micrometers or longer. Since the claim only define the first area being provided between the second area and seriously fails to define the edge of the first area with respect to the second area, it is assumed that the first area of Sato's device (as shown in Fig. 1) is defined as any area in the middle of the ridge (103) between the sides and the top surface of layer 103 as long as it is in between the layer. In other words, the layer 103 has a ridge shape and a width that is the same as that of the substrates and other layers. The top portion of the ridge is limited with a width that is smaller than the width of the substrate and substantially equals to the width of layer 104. Therefore the first and second areas are defined so that the first area is between the second area without any other limitation. Sato also discloses

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that the active layer 105 including N and the laser emits light with wavelength larger than 1.3 micrometers.

With respect to claims 2-3 and 19-20, since Sato discloses the active layer 105 being made of InGaNAs which includes both N and Ga.

With respect to claims 4 and 21, it is inherent that the refractive index of said second conductivity type semiconductor layer is higher than that of current blocking layer in order for the current blocking layer to block current.

With respect to claims 5, 8 and 22, Sato discloses an additional semiconductor layer 104 containing III-V compound semiconductor (As) and provided between said first conductivity type semiconductor region and said active layer.

With respect to claims 6, 9 and 23, Sato discloses additional semiconductor layer 106 containing III-V compound semiconductor (As) and provided between said second conductivity type semiconductor region and said active layer.

With respect to claims 7 and 24-26, Sato discloses the whole components including layers 103 and 107 which are first and second conductivity type semiconductor layers being SCH (paragraph 0029).

With respect to claims 15 and 32, Sato discloses the GaAs substrate.

With respect to claims 16 and 33, the claim recites the intended use of the device and would not be given weight. However, Sato also uses the device as semiconductor laser diode.

With respect to claim 18, Sato discloses the claimed invention as shown in the Fig. 1 so that the etchant stops after etching the active and second conductivity type semiconductor layer.

With respect to claims 12 and 29, Sato discloses the SCH layers made of GaAs.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 10-11, 13-14, 27-28, and 30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato (JP 10-075017) in view of Anayama Chikashi (JP 07-154023). Sato discloses the claimed invention except for the current blocking layers, and first and second conductivity type semiconductor regions being made of material not containing aluminum. Anayama discloses a laser with ridge structure with current blocking layer 6, first and second conductivity type semiconductor regions 5 and 7 made of material Si doped GaAs which does not contain aluminum. However the active layer is formed below the first conductivity type semiconductor layer 5 in Fig. 1, not provided on the second portion of said first conductivity type semiconductor region as claimed. For the advantageous benefit of the invention, it would have been obvious to the one having ordinary skill in the art at the time the invention was made to provide a current blocking layer without using aluminum to avoid oxidizing as taught by Anayama to Sato but still producing the laser with the wavelength larger

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than 0.9 micrometers. Furthermore, Anayama discloses GaInP as first and second conductivity type semiconductor regions which is the case when $x_1 = 0$, $x_2 = 0$, $y_2 = 1$, and $x_3 = 0$.

Communication Information

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phillip Nguyen whose telephone number is 571-272-1947. The examiner can normally be reached on 9:00 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MINSUN HARVEY, can be reached on 571-272-1835. The fax phone number for the organization where this application or proceeding is assigned is **571-273-8300**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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MINSUN OH HARVEY
PRIMARY EXAMINER